PARADYNE®

**AμD8000-12, AμD8000-12B, and AμD8000Q-12B
12-Port ADSL Micro DSLAMs**
Installation Instructions

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Contents

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Unpacking and Inspecting the Equipment

⚠ **HANDLING PRECAUTIONS FOR STATIC-SENSITIVE DEVICES**

This product is designed to protect sensitive components from damage due to electrostatic discharge (ESD) during normal operation. When performing installation procedures, however, take proper static control precautions to prevent damage to equipment. If you are not sure of the proper static control precautions, contact your nearest sales or service representative.

Unpack and inspect the equipment. The following components should be included:

- 1 AµD8000

- 4 Rubber Bumpers

- 1 DB9 Socket to RJ45 Plug Adapter

If there is visible damage, do not attempt to connect the device. Contact your sales representative.
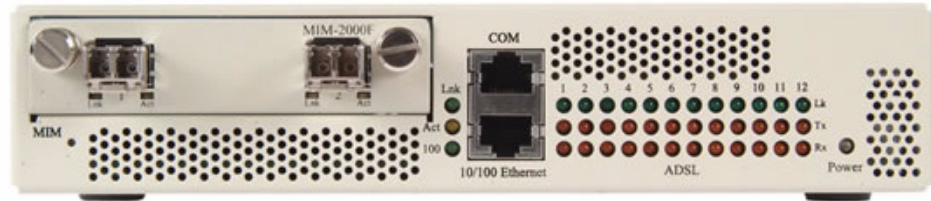
Figure 1. AµD8000-12 ADSL Micro DSLAM

Selecting the Installation Site

CAUTION: The maximum recommended ambient temperature for the AµD8000 is 65° C (149° F). Do not stack AµD8000 chassis on top of one another; the air vents on top of the chassis require a minimum of 0.5-inch (1.3 cm) free airspace for adequate circulation.

Affix the (4) provided rubber bumpers to the bottom corners of the unit to provide surface grip.

Tabletop

Place the AµD8000 such that the cables will not become a tripping hazard or pull loose from the unit.

Rack

AµD8000 micro DSLAMs may be placed side by side horizontally on a standard 19" shelf. Ensure all cables are secured such that they will not become a tripping hazard or pull loose from the unit.

Remote Cabinet

AµD8000 micro DSLAMs may be placed side by side horizontally within the cabinet. Vertical door mount brackets are available for purchase as separate accessories; contact your sales representative for further information.

Powering Up the AµD8000

Attach DC power leads and a ground connection to one of the two terminal blocks on the back of the AµD8000. Either terminal block may be used. Although not required for operational purposes, both terminal blocks may be connected for redundancy.

To apply power to the AµD8000:

▶ **Procedure**

1. Loosen the screws on top of the terminal block

2. Insert the leads and ground wire into the front of the terminal block. Be sure to attach the positive lead to the positive terminal (+) and the negative lead to the negative terminal (−) as indicated on the terminal block labels.

3. Tighten the screws.

4. Turn on the power source and verify that the Power LED on the front of the unit is illuminated. Solid amber illumination indicates one power terminal is connected, and solid green illumination indicates both power terminals are connected.

Connecting the SHDSL Line(s)

G.SHDSL is the default line code for the AµD8000, and the default bandwidth is 272 kbps. If desired, these settings may be changed once the AµD8000 has been installed and initial configurations have been completed.

To connect the SHDSL lines:

▶ **Procedure**

1. Plug your DSL cable's RJ21 connector into the corresponding RJ21 port on the back of the AµD8000. For most applications, an AµD8000 SHDSL link requires a straight-through DSL cable. The AµD8000 can be connected with a remote subscriber unit via either a single DSL line or double DSL lines (loop bonding).

2. For each port being connected to a remote subscriber unit, verify that the SHDSL link has been established. The SDSL Connection LED for that port will pulse green to indicate the connection has been made. Link up time can vary from one to five minutes depending on the quality, gauge and distance of the copper cables.

Loop Bonded SHDSL Connection

CAUTION: Configure identically any ports on the AµD8000 intended for a loop bonded connection prior to connection. If two ports with different configurations are loop bonded, the AµD8000 will automatically use the configurations of the lowest numbered port of the two being bonded and will copy those configurations to the higher numbered port. See the NMS User's Guide and the CLI User's Guide for configuration instructions. If default settings are to be used for both ports, then prior configuration is not necessary and you may proceed with installation.

Using two SHDSL lines for one network connection (loop bonding) will net twice the speed and data passing capability as a single-line SHDSL connection. A second SHDSL line also provides redundancy. Any two AµD8000 ports (consecutive or not) may be connected to an SNE2020-S or SNE2020G-S subscriber unit to establish a loop bonded connection.

SHDSL Parameters

Line Code

Default: G.SHDSL

Line code configuration for the AµD8000 applies to all ports; individual ports cannot be configured with different line codes.

- G.SHDSL (default) – Transmission Convergence/Pulse Amplitude Modulation (TC/PAM) line code is a sixteen-level PAM technique which incorporates advanced Trellis code, precoding, spectral shaping, equalization circuits and forward error correction. Otherwise known as G.SHDSL.

- CAP – Carrierless Amplitude and Phase (CAP) line code modulates transmit and receive signals into two wide-frequency bands that can pass through a filter without being attenuated.

- 2B1Q – Two Binary, One Quaternary (2B1Q) line code is a four-level PAM technique which reduces the signaling rate to half of the bit rate, thereby doubling transmission efficiency.

Bandwidth

Default: 272 kbps

There are nine bandwidth options for AµD8000 subscriber connections. Distance capabilities at each speed vary, dependent upon the type of line code being utilized. Distances listed below assume the use of 26 American Wire Gauge (AWG) cable; connections made with cable of a heavier gauge will link up at greater distances. The units may not link up if the cable is in poor condition or if the cable distance is greater than a particular bandwidth will support; if a link is achieved under such conditions, traffic quality may be affected.

Table 1. Bandwidth Options

Line Code	Metric	2,320 kbps	2,064 kbps	1,552 kbps	1,040 kbps	784 kbps	528 kbps	400 kbps	272 kbps	144 kbps
G.SHDSL Distance	Feet	11,300	12,200	12,800	16,000	16,800	18,400	19,400	20,200	25,400
	Meters	3,444	3,719	3,901	4,877	5,121	5,608	5,913	6,157	7,742
CAP Distance	Feet	11,000	11,900	12,600	15,500	16,000	17,900	18,900	23,100	24,700
	Meters	3,353	3,627	3,840	4,724	4,877	5,456	5,761	7,041	7,529
2B1Q Distance	Feet	10,400	10,800	13,400	14,800	15,800	17,400	18,200	19,200	23,800
	Meters	3,170	3,292	4,084	4,511	4,816	5,304	5,547	5,852	7,254

Remote subscriber units determine line speed via their communication with the AµD8000.

Connecting the Uplink Interface Line(s)

Follow the instructions below according to the type of uplink interface connections available on the AµD8000 model you are installing.

NOTE: The MGMT, 10/100 and T1/E1 Ports on the front of the AµD8000 are labeled numerically from left to right; corresponding LEDs are located to the left of the ports and are labeled in the same manner.

10/100 Ethernet Uplink

The 10/100 Ethernet uplink is labeled Port 2 on some models.

The 10/100 Ethernet uplink port auto-negotiates speed and duplex mode in accordance with the remote equipment to which it is connected. These Ethernet configurations cannot be set on the AµD8000. For the best connection results, the remote device (PC, hub, or switch) should be set to auto-negotiate speed and duplex mode as well. If the remote device cannot be configured to auto-negotiate, speed may be set at either 10 Mbps or 100 Mbps but duplex mode must be set to Half Duplex. A 10/100BaseT Ethernet connection cannot be made if the remote device is set to Full Duplex.

▶ **Procedure**

1. Plug the Ethernet cable RJ45 connector into the corresponding RJ45 10/100 Ethernet port on the front of the AµD8000. For most applications, an AµD8000 Ethernet uplink connects to a PC using a straight-through Ethernet cable and to a hub or a switch using a crossover Ethernet cable. For any other connection combinations you must verify the pinouts of the Ethernet device to which you are connecting the AµD8000 in order to determine which type of cable is required.

2. Verify the connection; solid or flashing green illumination of the 10/100 LED (LED 2 on some models) indicates a 100 Mbps Ethernet link has been established, solid or flashing amber illumination of the 10/100 LED indicates a 10 Mbps link has been established.

Duplex Mode

Default: Auto-Negotiate (non-configurable)

■ Half Duplex – Receive and transmit functions are mutually exclusive; data transmission occurs in only one direction at a time. Packet collisions are common.

■ Full Duplex – The Ethernet line can receive and transmit simultaneously, effectively upping the aggregate bandwidth from 10 Mbps to 20 Mbps (or from 100 Mbps to 200 Mbps) and preventing packet collisions.

T1 Uplink

▶ **Procedure**

1. Plug the T1 cable into the T1 RJ45 port on the front of the AµD8000. For most applications, AµD8000 T1 Uplinks require a straight-through T1 cable.

2. Verify the connection; flashing or pulsing green illumination of the corresponding LEDindicates a T1 link has been established.

3. Repeat the steps if you have two T1 connections.

Frame Type

Default: Extended Super Frame (ESF)

Frame type is the T1 data encapsulation method. A T1 frame consists of 193 bits (8-bit samples of each of the 24 T1 timeslots plus a synchronization bit) transmitted at a rate of 8,000 frames per second (1,544 kbps) across the T1 line.

■ Extended Super Frame (default) – Extended Super Frame (ESF) format, used in Wide Area Networks, assembles data into 24-frame transmission clusters and integrates the following:

— Facilities Data Link (FDL) - communication support through in-service monitoring and diagnostics

— Cyclic Redundancy Check (CRC) - detects line errors and scrutinizes data integrity

■ Super Frame – Super Frame (SF) format assembles data into 12-frame transmission clusters

Line Code

Default: Bipolar with 8 Zero Substitution (B8ZS)

Line code is a T1 mode of transmission. The following line code options fall within the International Telecommunication Union - Telecommunication Standardization Sector (ITU-T) G.703 Standard for Transmission Facilities.

■ Bipolar with 8 Zero Substitution (default) – B8ZS is used to accommodate the minimum ones density requirement in the North American public network. B8ZS line encoding helps prevent loss of synchronization between the AµD8000 and remote equipment by using bipolar violations to guarantee that pulses are always present in the line.

■ Alternate Mark Inversion – Alternate Mark Inversion (AMI) is a T1 mode of transmission that alternates positive and negative pulses. It is typical with AMI for a link to encounter long strings of zeros which can potentially cause loss of synchronization between units. Paradyne products, however, meet the North American minimum ones density requirement internally such that loss of synchronization is prevented between the AµD8000 and remote T1 devices with AMI as is with B8ZS.

Line Buildout

Default: 0 dB

Shorter distances between the AµD8000 and remote devices often require increasing line attenuation in order to prevent the T1 signal from becoming too strong for repeaters, switches and other T1 transmission equipment that may be encountered along the line. Increased line attenuation translates to decreased T1 transmit amplitude.

■ 0 dB (default) – Receivers on most newer T1 transmission equipment can automatically adjust for incoming amplitude, allowing them to run at zero attenuation regardless of distance.

■ –7.5 dB, –15 dB, –22.5 dB – Some older T1 transmission equipment cannot automatically adjust for incoming amplitude and line attenuation must be set accordingly.

E1 Uplink

▶ **Procedure**

1. Plug the E1 cable into the E1 RJ45 port on the front of the AµD8000. For most applications, AµD8000 E1 Uplinks require a straight-through E1 cable.

2. Verify the connection, flashing or pulsing green illumination of the corresponding LED indicates an E1 link has been established.

3. Repeat the steps if you have a second E1 connection.

Frame Type

Default: Cyclic Redundancy Check (CRC)

Frame type is an E1 data encapsulation method. An E1 frame consists of 249 bits (8-bit samples of each of the 31 E1 timslots plus a synchronization bit) transmitted at a rate of 8,000 frames per second (1,992 kbps) across the E1 line.

- Cyclic Redundancy Check (default) – Cyclic Redundancy Check (CRC) detects line errors and scrutinizes data integrity across the E1 line by appending a CRC character to the end of the data block. The character is a hexidecimal value calculated from the contents of each data block. The remote equipment makes a similar calculation upon receipt of each data block and requests retransmission if there is a difference.

- No Cyclic Redundancy Check – CRC is disabled.

Line Code

Default: High Density Binary 3 (HDB3)

Line code is an E1 mode of transmission. The following line code options fall within the International Telecommunication Union - Telecommunication Standardization Sector (ITU-T) G.703 Standard for Transmission Facilities.

- High Density Binary 3 (default) – High Density Binary 3 (HDB3) is used to accommodate the minimum ones density requirement in the European public network. HDB3 line encoding helps prevent loss of synchronization between the AµD8000 and remote E1 equipment by using bipolar violations to guarantee that pulses are always present in the line.

- Alternate Mark Inversion – Alternate Mark Inversion (AMI) is an E1 mode of transmission that alternates positive and negative pulses. It is typical, with AMI, for a link to encounter long strings of zeros which can potentially cause loss of synchronization between units. Paradyne products however, meet the European minimum ones density requirement internally such that even with AMI loss of synchronization is prevented between the AµD8000 and remote E1 devices.

Default Settings

No configuration is necessary for an AµD8000 to operate at default settings.

User Access Defaults

Username/Password

ACCESS	USERNAME*	PASSWORD*
read/write	superuser	Password
read only	general	Password

* Usernames and passwords are case sensitive.

Community String

ACCESS	COMMUNITY STRING*
read/write	Password
read only	Password

* Community strings are case sensitive.

System Defaults

PARAMETER	DEFAULT
Gateway	0.0.0.0
Inband Management	disabled
Inband Management VLAN ID	0 (off)
IP Address	192.168.254.252
Mgmt (Management) IP Address Filter Range	0.0.0.0 - 255.255.255.255 (all)
Subnet Mask	255.255.255.0
TFTP (Trivial File Transfer Protocol)	on
Uplink DSLAM Interconnection	1 (neither/off)

SHDSL Circuit Defaults

PARAMETER	DEFAULT
Backbone-VLAN	0 (off)
Circ. ID (Circuit Identification)	n/a (no default)
Flood	Upl (Uplink)
IP Range 1	0.0.0.0 - 255.255.255.255
IP Range 2	0.0.0.0 - 0.0.0.0
Line Code	G.SHDSL
Pri (VLAN Priority)	0 (none)
Protocol	All
Speed	272 kbps
VLAN Range	0-0 (off)

Uplink Interface Defaults

10/100 Ethernet Uplink

PARAMETER	NON-CONFIGURABLE
Speed	Auto-Negotiate
Duplex Mode	Auto-Negotiate

T1 Uplink

PARAMETER	DEFAULT
Frame Type	ESF (Extended Super Frame)
Line Code	B8ZS (Bipolar with 8 Zero Substitution)
Line Buildout	0 dB

E1 Uplink

PARAMETER	DEFAULT
Frame Type	CRC (Cyclic Redundancy Check)
Line Code	HDB3 (High Density Bipolar 3)

Initial Configuration

Initial configuration of an AµD8000 can be accomplished via either Command Line Interface (CLI) or the Network Management System (NMS). Initial configuration using the CLI requires a direct connection from your PC to the RJ45 COM (communication) Port. Initial configuration using the NMS requires a direct connection from your PC to the Ethernet RJ45 MGMT (management) Port. For more complete information regarding system configuration with the NMS and the CLI, please refer to the NMS Management User's Guide and the CLI Management User's Guide.

NOTE: Although the AµD8000 can also be managed via Simple Network Management Protocol (SNMP v1.0), initial configuration of the IP Address, Subnet Mask and Gateway must first be completed via the CLI or NMS before you can access the AµD8000 management system with SNMP.

Configuration Using the Command Line Interface (CLI)

Initial configuration of an AµD8000 via the CLI requires the provided DB9 socket to RJ45 plug adapter, a straight-through RJ45-to-RJ45 Ethernet cable, and a terminal emulation program installed on your PC. See the CLI User's Guide for complete system requirements.

To establish a connection with the AμD8000:

▶ **Procedure**

1. Plug the provided DB9 socket to RJ45 plug adapter into the RS232 serial port on your PC. See *DB9 to RJ45 Adapter* on page 24 for pin assignments.

2. Connect one end of a straight-through Ethernet cable to the adapter plugged into your PC, and the other end of the cable into the RJ45 COM Port located on the front of the AμD8000.

3. Launch a terminal emulation program on your PC and configure the program settings. Actual settings will depend upon the program you use, although they should be modeled after the list below. Refer to your program user manual for further information.

Baud: 9600
Data Bits: 8
Flow Control: None
Port: Com 1
Parity: none
Stop bits: 1
Transmit Delay: n/a

Logging In

Once your Terminal Emulator has been launched and configured, the following information will appear on your screen:

```
Copyright(C) [year]
[product] Version [number] (Boot Prom [number] )
System Build Date: [date,time,year]
Mac Address: [address] , IP Address: [address]
```

This information will be followed by a request for username and, once username has been entered, a request for password. You must log in as a superuser in order to make configuration changes.

Username/Password Defaults		
ACCESS	USERNAME*	PASSWORD*
read/write	superuser	Password
read only	general	Password

* Usernames and passwords are case sensitive.

Setting the IP Address, Subnet Mask, and Gateway

Most system settings can be configured with the CLI through a direct COM Port connection regardless of the IP Address, Subnet Mask, and Gateway settings on your AµD8000. However, you will not be able to use NMS or SNMP unless either your AµD8000 has been configured with proper settings for these three parameters or your PC has been configured to accept the defaults.

To set IP Address, Subnet Mask, and Gateway, enter the following commands (replacing xxx.xxx.xxx.xxx with meaningful values).

```
set slot 1 ip_address xxx.xxx.xxx.xxx*

set slot 1 subnet_mask xxx.xxx.xxx.xxx*

set slot 1 default_gateway xxx.xxx.xxx.xxx*
```

Setting Up Inband Management

If remote network utilization of NMS, CLI, or SNMP is desired, you must configure Inband Management.

```
set slot 1 inband_management on
```

Setting the Inband Management VLAN ID

If your network is running VLANs to facilitate packet direction or promote packet security, you must set an Inband MGMT (Management) VLAN ID. Do not set an Inband MGMT VLAN ID if your network is not running VLANs. In the following command, replace the *x* with a VLAN ID. VLAN ID may be from 0 to 4095.

```
set slot 1 inband_mgmt_vlan_id x
```

Other Configuration with the CLI

You may now make desired configurations with CLI either through the established direct connection or, if you chose to set Inband Management, via a remote network connection using Telnet. Likewise, if you chose to set Inband Management, you will now also be able to utilize SNMP across the network. Refer to the CLI and SNMP Management User Guide for information regarding specific parameter configurations.

To help ensure that any subsequent configurations of the management system will not be inadvertently altered or deleted, change default community strings immediately following initial setup. See the SNMP Management User's Guide.

Logging Out of the CLI

When configuration is complete, log out. If you forget to log out, the CLI will automatically log you out after five minutes of inactivity.

```
logout
```

CAUTION: If you disconnect your PC from the COM Port without logging out and a new connection is established before the five-minute inactivity period has expired, the new user will have full access to the management system without being required to log in.

Configuration Using the Network Management System (NMS)

Initial configuration of an AµD8000 via the NMS requires a straight-through RJ45 to RJ45 Ethernet cable and a web browser such as Microsoft Internet Explorer installed on your PC. See the NMS Management User Guide for complete system requirements.

Configuring Your PC to Enable Communication with the NMS

The following instructions are based on a Windows operating system; different operating systems may vary in their requirements. Contact your System Administrator or Information Technology Manager if you are having trouble with these settings.

To set up your Windows-based PC for use with the NMS:

▶ **Procedure**

1. Click the Windows Start button.

2. Select Settings.

3. Click on Control Panel.

4. Double-click on the Network icon.

5. Click on the Configuration tab.

6. Scroll down under Network Components and double-click on your TCP/IP Ethernet Adapter.

7. Click on the IP Address tab.

   NOTE: Make note of the current IP Address and Subnet Mask configurations on your PC before entering the new values; once initial configuration of NMS has been completed, you will need to reconfigure your PC with these original values.

8. Click on "Specify an IP Address".

9. Enter an IP Address for your PC from 192.168.254.1 through 192.168.254.251. (The default IP address of the AµD8000 is 192.168.254.252.)

10. Enter a Subnet Mask of 255.255.255.0.

11. Click on Add.

12. Click on OK. Reboot your PC if so prompted.

Connecting Your PC to the MGMT Port (Port 1)

The MGMT (Management) Port does not have switching capabilities; its main purpose is to allow a direct PC connection for SNMP and NMS access. A direct connection with the MGMT Port may also be used to access the management system with the CLI via Telnet (see the CLI Management User's Guide).

The 10/100 Ethernet MGMT Port auto-negotiates speed and duplex mode; these configurations cannot be set on the AµD8000. For the best configuration results, your PC should be set to auto-negotiate speed and duplex mode as well. If your PC cannot be configured to auto-negotiate, speed may be set at either 10 Mbps or 100 Mbps but duplex mode must be set to Half Duplex; a 10/100 Ethernet MGMT connection cannot be made if your PC is set to Full Duplex.

Using a straight-through Ethernet cable, connect your PC to the Ethernet RJ45 MGMT Port on the front of the AµD8000 and verify the connection. The MGMT, 10/100 and T1/E1 ports are labeled numerically from left to right; corresponding LEDs are located to the left of the ports and are labeled in the same manner. Solid or flashing green illumination of the MGMT LED (LED 1) indicates a 100 Mbps connection has been established. Solid or flashing amber indicates a 10 Mbps connection has been established.

See *Ethernet and MGMT Port Pinouts* on page 23.

Launching a Web Browser and Logging In

▶ **Procedure**

1. Launch a web browser such as Microsoft Internet Explorer (v4.0 or higher) or Netscape Navigator (v4.0 or higher).

2. Type the AµD8000's default IP Address (192.168.254.252) into the address field at the top of the browser window and press the Enter key.

3. The NMS Log In window will pop up: enter the default username and password. You must log in as a Superuser in order to make configuration changes.

Username/Password Defaults		
ACCESS	USERNAME*	PASSWORD*
read/write	superuser	Password
read only	general	Password

* Usernames and passwords are case sensitive.

4. Click on OK.

System Configuration

The NMS main window will appear automatically upon log in.

▶ **Procedure**

To configure management parameters:

1. Click on the System Configuration (chassis) button in the top, left-hand corner of the window. A floating window will pop up with the AµD8000 model type, revision and MAC Addresses, as well as several fields for configuration.

   Set all applicable fields in the System Configuration window before clicking on the Submit button, as each time the Submit button is clicked you will be required to re-establish NMS connectivity.

Parameter	Description
IP Address	Specify the management IP address for the DSLAM.
Subnet Mask	Specify the subnet mask for the IP address.
Gateway	Specify the first-hop gateway address.
Inband MGMT	If remote network utilization of NMS, CLI or SNMP is desired, click the Inband MGMT box so that a checkmark appears. CAUTION: Managing your DSLAM via an inband connection can increase the security risks of unapproved and/or unwanted users accessing the management system. It is recommended that inband management be disabled when not in use.
Management IP Address Range	Enter the range of IP Addresses from which you wish to allow inband management of your DSLAM; addresses outside of this range will not be able to access the management system.
TFTP	Trivial File Transfer Protocol (TFTP) is the method by which port configurations are saved to local files and new firmware versions are obtained. For security purposes, it is recommended that TFTP be set to OFF when not in use.
VLAN Id	If your network is running VLANs to facilitate packet direction and/or promote packet security, enter your proprietary Inband Management VLAN ID. If your network is not running VLANs, leave the field blank.

2. Click on Submit. NMS connectivity will be lost immediately upon clicking the Submit button; you must close your web browser, reconfigure the IP Address and Subnet Mask on your PC and then re-launch your web browser.

Reconfiguring the IP Address and Subnet Mask on Your PC With the Original Values

The following instructions are based on a Windows operating system; different operating systems may vary in their requirements.

To return your Windows-based PC to its original IP address:

▶ **Procedure**

1. Click on the Windows Start button.

2. Select Settings.

3. Click on Control Panel.

4. Double-click on the Network icon.

5. Click on the Configuration tab.

6. Scroll down under Network Components and double-click on your TCP/IP Ethernet Adapter.

7. Click on the IP Address tab.

8. Depending upon which option was formerly selected, do one of the following:

   — Click on Obtain an IP Address Automatically

       or

   — Click on Specify an IP Address and then manually enter your proprietary IP Address and Subnet Mask

   NOTE: The Subnet Mask entered now must match the one set for the AµD8000. The IP Address entered must be in the same subnet.

9. Click on OK. Reboot your PC if so prompted.

RAM and NVRAM

Configuration backup is inherent in the AµD8000. Upon initial power-up, default parameters will remain in place unless changed through the NMS, CLI, or SNMP. Once changed, new configurations will automatically be recorded in both Random Access Memory (RAM) and Non-Volatile Random Access Memory (NVRAM). Although data stored in RAM will be erased if the AµD8000 loses power, data stored within NVRAM will remain intact (even if the unit loses power) unless deliberately cleared or reconfigured.

Local Files

Individual port configurations can be saved locally on your PC as a backup, or for use as a template for future configurations. Once the AµD8000 has been configured as desired, the settings can be uploaded through a Trivial File Transfer Protocol (TFTP) tool with a GET command and the following information:

Host name: [Micro DSLAM IP Address]

Remote filename: NVR_CFG.bin.[superuser password]

Local filename: [user preference]

For example:

```
tftp get 137.26.10.32:NVR_CVG.bin.Password myfile
```

Port configuration files can also be downloaded from a local file to a AµD8000 by use of a TFTP Put command. Refer to your TFTP user manual.

NOTE: Only individual port configurations can be saved to a local file. Chassis configurations cannot be uploaded or downloaded; they must be manually configured for each unit.

LED Indications

Some LEDs are described in the following table as pulsing and flashing. A pulsing LED blinks steadily at a rate of once per second. A flashing LED blinks at a more rapid, less constant rate.

Table 2.   LED Behavior (1 of 4)

LED	STATE	INDICATION	ADDITIONAL INFORMATION
Power	Solid green	AµD8000 is receiving power	Both power terminals are connected.
	Solid amber	AµD8000 is receiving power	One of the two power terminals is connected.
	No illumination	No power	If the AµD8000 is not receiving power, none of the LEDs will be illuminated.

Table 2.   LED Behavior (2 of 4)

LED	STATE	INDICATION	ADDITIONAL INFORMATION
MGMT: LED 1 (Management 10/100 Ethernet Link)	Flashing green	100 Mbps Management connection is established and active	Traffic is flowing at 100 Mbps. NOTE: The MGMT LED pertains only to direct connections between the AµD8000 and your PC; it does not pertain to remote network access of NMS or SNMP.
	Solid green	100 Mbps Management connection is established	No current traffic flow.
	Flashing amber	10 Mbps Management connection is established and active	Traffic is flowing at 10 Mbps.
	Solid amber	10 Mbps Management connection is established	No current traffic flow.
	No illumination	No Management connection	
10/100: LED 2 (10/100 Ethernet Uplink)	Flashing green	100 Mbps Ethernet uplink connection is established and active	Traffic is flowing at 100 Mbps.
	Solid green	100 Mbps Ethernet uplink connection is established	No current traffic flow.
	Flashing amber	10 Mbps Ethernet uplink connection is established and active	Traffic is flowing at 10 Mbps.
	Solid amber	10 Mbps Ethernet uplink connection is established	No current traffic flow.
	No illumination	no Ethernet uplink connection	

Table 2. LED Behavior (3 of 4)

LED	STATE	INDICATION	ADDITIONAL INFORMATION
T1: LEDs 2–4 (T1 Uplink)	Flashing green	T1 uplink connection is established and active	Traffic is flowing.
	Pulsing green	T1 uplink connection is established	No current traffic flow.
	Solid green	Problematic T1 connection	The uplink connection exists but there is indication of a problem with the T1 line.
	Pulsing amber	Blue Alarm – An indirect connection has been lost; the uplink port may no longer be receiving data from the remote T1 provider.	The remote T1 provider unit (TAM1500-12, TNE1500-12-AC/DC, or TNE1500-P) has lost a connection with an intermediate device and is in Red or Yellow Alarm (see below).
	Solid amber	Yellow Alarm – The outgoing uplink connection has been lost; no data is being transmitted.	The remote T1 provider unit (TAM1500-12, TNE1500-12-AC/DC, or TNE1500-P) has lost its incoming connection and is in Red Alarm (see below).
	No illumination	Red Alarm – The incoming uplink connection has been lost; no data is being received.	If the outgoing uplink connection has also been lost then the remote T1 provider unit (TAM1500-12, TNE1500-12-AC/DC, or TNE1500-P) will be in Red Alarm as well.
E1: LEDs 2–4 (E1 Uplink)	Flashing green	E1 uplink connection is established and active	Traffic is flowing.
	Pulsing green	E1 uplink connection is established	No current traffic flow.
	Solid green	Problematic E1 connection	The uplink connection exists but there is indication of a problem with the E1 line.
	Pulsing amber	Alarm Indication Signal (AIS) – An indirect connection has been lost; the uplink port may no longer be receiving data from the remote E1 provider.	The remote E1 provider unit (EAM2000-12, ENE2000-12-AC/DC, or ENE2000-P) has lost a connection with an intermediate device and has LOS or RAI (see below).
	Solid amber	Remote Alarm Indication (RAI) – The outgoing uplink connection has been lost; no data is being transmitted.	The remote E1 provider unit (EAM2000-12, ENE2000-12-AC/DC, or ENE2000-P) has lost its incoming connection and has LOS (see below).
	No illumination	Loss of Synchronization (LOS) – The incoming uplink connection has been lost; no data is being received.	If the outgoing uplink connection has also been lost then the remote E1 provider unit (EAM2000-12, ENE2000-12-AC/DC, or ENE2000-P) will have LOS as well.

Table 2.   LED Behavior (4 of 4)

LED	STATE	INDICATION	ADDITIONAL INFORMATION
SDSL Connection: LEDs 1–6 or LEDs 1–12	Flashing green	SHDSL connection is established and active	Traffic is flowing.
	Pulsing green	SHDSL connection is established	No current traffic flow.
	Solid green	Problematic SHDSL connection	A connection exists but there is indication of a problem with the SHDSL line.
	No illumination	No SHDSL connection	

Connector Pin Assignments

SHDSL RJ21 Pinouts – 6-Port

PORT	1	2	3	4	5	6
Tip	26	27	28	29	30	31
Ring	1	2	3	4	5	6

(pins 7-25 and 32-50 are not used)

SHDSL RJ21 Pinouts – 12-Port

PORT	1	2	3	4	5	6	7	8	9	10	11	12
Tip	26	27	28	29	30	31	32	33	34	35	36	37
Ring	1	2	3	4	5	6	7	8	9	10	11	12

(pins 13-25 and 38-50 are not used)

E1 and T1 RJ45 Pinouts

If the cable you are using is shielded, it must be grounded through Pins 3,6,7, and 8.

PIN	CONNECTION
1	Rx Ring
2	Rx Tip
3	not used
4	Tx Ring
5	Tx Tip
6	not used
7	not used
8	not used
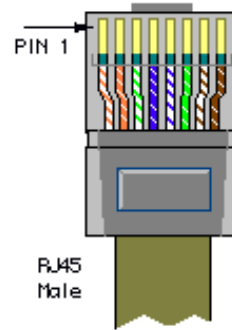
Ethernet and MGMT Port Pinouts

PIN	CONNECTION
1	Rx+
2	Rx–
3	Tx+
4	not used
5	not used
6	Tx–
7	not used
8	not used
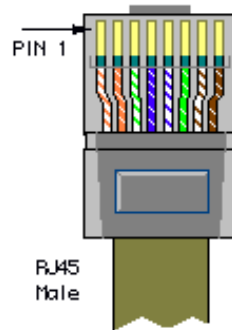
DB9 to RJ45 Adapter

The provided COM port adapter has the following pinouts.

Pin	AµD8000 RJ45 PORT Pinouts		Direction	PC RS232 Serial Port Pinouts	
1	Transmit Data	TxD	->	RxD	Receive Data
2	Data Set Ready	DSR	<-	RTS	Request to Send
3	Clear to Send	CTS	<-	DTR	Data Terminal Ready
4	Receive Data	RxD	<-	TxD	Transmit Data
5	Ground	GND	<->	GND	Ground
6	Data Terminal Ready	DTR	->	CTS	Clear to Send
7	Request to Send	RTS	->	DSR	Data Set Ready
8	No Connect	NC	–	DCD	Data Carrier Detect

⚠ Important Safety Instructions

1. Read and follow all warning notices and instructions marked on the product or included in the manual.

2. This product is to be connected to a nominal –48 VDC supply source that is electrically isolated from the AC source. The positive terminal of the DC source is to be reliably connected to earth. Connect a green/yellow earthing (grounding) wire to the protective earthing (grounding) screw, identified by the protective earth symbol on the back of the chassis.

3. This product may only be used in a Restricted Access Location in accordance with the requirements of the National Electric Code, ANSI/NFPA 70, or in accordance with the standards and regulatory requirements of the country in which it is installed. A Restricted Access Location is a secure area (dedicated equipment rooms, equipment closets, or the like) for equipment where access can only be gained by service personnel or by users who have been instructed about the reasons for the restrictions applied to the location and about any precautions that must be taken. In addition, access into this designated secured area is possible only through the use of a tool or lock and key, or other means of security, and is controlled by the authority responsible for the location.

4. A readily accessible disconnect device as part of the building installation shall be incorporated in fixed wiring. The DC disconnect device must be rated at a minimum 48 VDC, minimum 2A. The disconnect device shall be readily accessible to the operator. The disconnect device must be included with an adequately rated fuse or circuit breaker in the ungrounded conductor. Use a minimum 18 AWG (0.75 mm²) fixed power source wires with strain retention.

5. Input power to the ALARM relay interface (located on the front panel of the enclosure) must not exceed 30 V rms or 48 VDC.

6. Do not allow anything to rest on the power cord and do not locate the product where persons will walk on the power cord.

7. Slots and openings in the cabinet are provided for ventilation. To ensure reliable operation of the product and to protect it from overheating, these slots and openings must not be blocked or covered.

8. Do not attempt to service this product yourself, as it will void the warranty. Opening or removing covers may expose you to dangerous high voltage points or other risks. Refer all servicing to qualified service personnel.

9. A rare phenomenon can create a voltage potential between the earth grounds of two or more buildings. If products installed in separate buildings are interconnected, the voltage potential may cause a hazardous condition. Consult a qualified electrical consultant to determine whether or not this phenomenon exists and, if necessary, implement corrective action prior to interconnecting the products.

10. General purpose cables are described for use with this product. Special cables, which may be required by the regulatory inspection authority for the installation site, are the responsibility of the customer. To reduce the risk of fire, use a UL Listed or CSA Certified, minimum No. 26 AWG (0.128 mm^2) telecommunication cable, or comparable cables certified for use in the country of installation.

11. The equipment is intended for installation in a maximum 149° F (65° C) ambient temperature, in an environment that is free of dust and dirt.

12. In addition, if the equipment is to be used with telecommunications circuits, take the following precautions:

— Never install telephone wiring during a lightning storm.

— Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations.

— Never touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.

— Use caution when installing or modifying telephone lines.

— Avoid using a telephone (other than a cordless type) during an electrical storm. There may be a remote risk of electric shock from lightning.

— Do not use the telephone to report a gas leak in the vicinity of the leak.

13. When installed in the final configuration, the product must comply with the applicable Safety Standards and regulatory requirements of the country in which it is installed. If necessary, consult with the appropriate regulatory agencies and inspection authorities to ensure compliance.

⚠ Regulatory Compliance for Class A Equipment

US Federal Communications Commission (FCC)

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Caution: Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.

Industry Canada

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la Classe A est conforme à la norme NMB-003 du Canada.

Europe

This Class A product complies with European Norm EN55022.

Warning: In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures to correct the situation.

Warranty, Sales, Service, and Training Information

Contact your local sales representative, service representative, or distributor directly for any help needed. For additional information concerning warranty, sales, service, repair, installation, documentation, training, distributor locations, or Paradyne worldwide office locations, use one of the following methods:

- **Internet:** Visit the Paradyne World Wide Web site at **www.paradyne.com**. (Be sure to register your warranty at **www.paradyne.com/warranty**.)

- **Telephone:** Call our automated system to receive current information by fax or to speak with a company representative.

  — Within the U.S.A., call 1-800-870-2221

  — Outside the U.S.A., call 1-727-530-2340

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